

Attorney Docket No.: **MGU-0027**  
Inventors: **Hanrahan and Luo**  
Serial No.: **10/790,273**  
Filing Date: **March 1, 2004**  
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This listing of claims will replace all prior versions, and  
listings, of claims in the application:

**Listing of Claims:**

Claim 1 (original): A method for labeling a membrane-localized protein in a cell comprising introducing a biotin target sequence tag into at least one loop domain of a membrane-localized protein and exposing said tagged protein to a biotin ligase in the presence of biotin so that the membrane localized protein is labeled.

Claim 2 (original): The method of claim 1, wherein the membrane-localized protein is an ion channel.

Claim 3 (original): The method of claim 2, wherein the membrane-localized protein is cystic fibrosis transmembrane conductance regulator.

Claim 4 (original): The method of claim 3, wherein the cystic fibrosis transmembrane conductance regulator has a defect in membrane localization.

Claim 5 (original): An isolated recombinant cystic fibrosis transmembrane conductance regulator protein comprising a biotin target sequence tag introduced into an extracellular loop of the cystic fibrosis transmembrane conductance regulator protein encoded by a nucleic acid sequence of SEQ ID NO:1.

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Claim 6 (original): The recombinant protein of claim 5, wherein the extracellular loop is loop four of the cystic fibrosis transmembrane conductance regulator protein encoded by a nucleic acid sequence of SEQ ID NO:1.

Claim 7 (original): A method for identifying an agent which corrects protein misfolding of a membrane-localized protein comprising

obtaining a cell which expresses a misfolded membrane-localized protein, wherein said protein is tagged with a biotin target sequence;

contacting the cell with a test agent and a biotin ligase in the presence of biotin so that the biotin target sequence tag of the protein is labeled; and

detecting the presence of labeled protein in cells contacted with the test agent, wherein the presence of labeled protein indicates the agent corrects protein misfolding of a membrane-localized protein.

Claim 8 (original): The method of claim 7, further comprising the step of contacting the cell with a permeabilizing agent before the step of detecting the presence of the labeled protein.